

Review Areas to be Addressed in a COL Application Referencing a Certified Design

Chapter 10 Steam and Power Conversion System

10.2 Turbine Generator

10.2.3 Turbine Rotor Integrity

- Describe the turbine rotor inservice test and inspection program. In this description, include inspection frequency, scope (components/areas to be inspected), inspection method for each component, acceptance criteria, disposition of reportable indications, and corrective actions. Provide the technical basis for the inspection frequency.
- Describe pre-service testing and the pre-service inspection program, including inspection scope, method, and acceptance criteria.
- Provide turbine rotor and bucket/blade material property data such as fracture appearance transition temperature, nil-ductility temperature, Charpy V-notch energy, yield strength, and fracture toughness data (K_{IC}).
- Describe the design features of the turbine rotor, shaft, couplings, and buckets/blades. Provide drawings. Identify the manufacturer and model number. Discuss fabrication methods.
- Provide design analyses for the rotor and buckets such as assumptions and loading combinations from various speeds. These analyses and calculations should demonstrate that the turbine rotor and buckets are designed with sufficient safety margin to withstand loadings from various overspeed events.
- Discuss how the environmental conditions, operational parameters, design features, fabrication, material properties, and maintenance are managed and considered to mitigate the following potential degradation mechanisms in the turbine rotor and buckets/blades: pitting, stress corrosion cracking, corrosion fatigue, low-cycle fatigue, erosion, and erosion-corrosion.

10.3 Main Steam Supply System

10.3.6 Steam and Feedwater System Materials

- Develop an erosion-corrosion monitoring program for carbon steel portions of the steam and power conversion system that contain water or wet steam.
- Develop a plant-specific pre-service inspection and inservice inspection programs which will include examinations of code and non-code components. These programs will reference the edition and addenda of ASME Code Section XI used for selecting components subject to examination. Describe the components that are exempted from examination by the applicable code, and

provide drawings or other descriptive information used for the examination. The applicant is responsible for ensuring the accessibility and inspectability of the subject piping components.

- When cast austenitic stainless steel materials are used, discuss what measures have been taken to ensure that these materials can be adequately inspected by volumetric methods as required in the inservice inspection program.
- Provide a detailed discussion of the mitigation implemented in the design, materials selection, fabrication, and operation to reduce the susceptibility of components made of stainless steel and nickel-based materials to intergranular stress-corrosion cracking.
- For non-code components, provide plant-specific materials property data such as chemistry, yield strength, fracture toughness data (K_{IC}), Charpy V-notch energy, nil-ductility temperature, fracture appearance transition temperature, manufacturer/fabricator, and heat number.

10.4 Other Features of Steam and Power Conversion System

10.4.6 Condensate Cleanup System

- Describe the purity requirements, the basis for those requirements, and the contribution of impurity levels from the secondary system to reactor coolant system activity levels.
- Provide an analysis of the demineralizer capacity and anticipated impurity levels.
- Describe the performance monitoring for impurity levels.
- Demonstrate the compatibility of the materials of construction with service conditions and reactor water chemistry.

10.4.8 Steam Generator Blowdown System (PWR)

- As part of the design bases, provide process design parameters, equipment design capacities, and expected and design temperatures for temperature - sensitive treatment processes (e.g., demineralization and reverse osmosis).
- Discuss the interfaces between the steam generator blowdown system and other plant systems.
- Provide coolant chemistry specifications to demonstrate compatibility with primary-to-secondary system pressure boundary material. Include a description of the bases for the selected chemistry limits as well as a description of the secondary coolant chemistry program for steam generator blowdown samples.